EXHIBIT 2

PACIFIC GAS AND ELECTRIC COMPANY

AND THE CITY OF SANTA CLARA

Bucks Creek Hydroelectric Project

FERC Project No. 619

FINAL LICENSE APPLICATION

Volume I: Public

Initial Statement, Executive Summary, Exhibits A, B, C, D, F, G, and H

December 2016

Exhibit A

Project Description

Pacific Gas and Electric Company (PG&E) and the City of Santa Clara (City), collectively the Licensees have prepared this project description for the Bucks Creek Hydroelectric Project (Project) for this Final License Application (FLA). Section 5.18(a)(5)(iii) of Title 18 of the Code of Federal Regulations (CFR) refers to Section 4.51 (License for Major Project–Existing Dam) for a description of information that an applicant must include 18 CFR § 4.51(b), as a reference states:

> (b) Exhibit A is a description of the project. This exhibit need not include information on project works maintained and operated by the U.S. Army Corps of Engineers, the Bureau of Reclamation, or any other department or agency of the United States, except for any project works that are proposed to be altered or modified. If the project includes more than one dam with associated facilities, each dam and the associated component parts must be described together as a discrete development. The description for each development must contain:
>
> (1) The physical composition, dimensions, and general configuration of any dams, spillways, penstocks, powerhouses, tailraces, or other structures, whether existing or proposed, to be included as part of the project;
>
> (2) The normal maximum surface area and normal maximum surface elevation (mean sea level), gross storage capacity, and usable storage capacity of any impoundments to be included as part of the project;
>
> (3) The number, type, and rated capacity of any turbines or generators, whether existing or proposed, to be included as part of the project;
>
> (4) The number, length, voltage, and interconnections of any primary transmission lines, whether existing or proposed, to be included as part of the project (see 16 U.S.C. 796(11));
>
> (5) The specifications of any additional mechanical, electrical, and transmission equipment appurtenant to the project; and
>
> (6) All lands of the United States that are enclosed within the project boundary described under paragraph (h) of this section (Exhibit G), identified and tabulated by legal subdivisions of a public land survey of the affected area or, in the absence of a public land survey, by the best available legal description. The tabulation must show the total acreage of the lands of the United States within the project boundary.

The Project is located entirely within Plumas County, California in the Sierra Nevada Mountains, approximately 17 mi southwest of the community of Quincy (Figure A-1). The Project is in the Sacramento River Hydrologic Region of northern California (CVRWQCB 2016), and is in the North Fork Feather River (NFFR) drainage basin. The Project includes Bucks Lake, Lower Bucks Lake, Grizzly Forebay, and their respective dams; Three Lakes, Milk Ranch Conduit and their respective diversions; and Grizzly and Bucks Creek powerhouses.

Table A.1.1-1 Summary of Active Milk Ranch Conduit Diversions

FERC Diversion No. (Drainage Name)	Status	Approximate Drainage Area (square miles)	Diameter of Diversion Pipe (inches)	Height of Diversion Dam (ft)
Milk Ranch Creek	Active Diversion	0.3	23	6.3
15 (North Fork Grouse Hollow Creek)	Active Diversion	0.3	18	1.5
14 (South Fork Grouse Hollow Creek)	Active Diversion (Currently out of service)	1.0	18-23	6.2
13 (Unnamed Drainage) 12 (Unnamed Drainage)	Active Diversion	0.3	12 18	1.7 Diverted by ditch to Diversion 13
11 (Unnamed Drainage)	Active Diversion	0.2	12	2.7
10 (Bear Trap Creek)	Active Diversion	0.2	18	1.2
9 (Slide Ravine)	Active Diversion	0.2	12	1.5
8	Not Operated	-	12	1.5
7	Not Operated	-	18	2.5
6	Not Operated	-	12	1.5
5	Not Operated	-	-	-
4	Not Operated	-	-	-
3 (Bear Ravine)	Active Diversion	1.1	21	4.6
2 (Unnamed Drainage)	Active Diversion	0.04	12	1
1	Not Operated	-	12	1

Source: Cotton, Shires, and Associates (2002)

= Data undetermined

A.1.1.2 Bucks Lake Dam and Reservoir

The Bucks Lake Dam consists of a rock-fill with concrete face dam. It has a structural height of 123 ft and a length of 1,320 ft. Bucks Creek Dam impounds Bucks Lake, extends reservoir length of 5 mi and a shoreline length of 14 mi. Total storage in the 1,827-acre reservoir is approximately 105,605 acre-ft (af) at the normal maximum water surface elevation of approximately 5,157 ft. The usable storage capacity of Bucks Lake is 105,300 af. From Bucks Lake, the Project's water flow is released immediately downstream into Lower Bucks Lake. The diversion/outlet tunnel consists of two 30-inch riveted steel pipes. Upstream control is provided by two 36-inch ball valves that are normally fully open, and downstream control is provided by two 30-inch-diameter, free discharge, needle valves that are operated by electronic motors.

A.1.1.3 Lower Bucks Lake Dam and Reservoir

The Lower Bucks Lake Dam consists of a concrete arch dam with a structural height of 99 ft and a length of 500 ft. Lower Bucks Lake Dam impounds Lower Bucks Lake, creating a reservoir length of approximately 1.1 mi and a shoreline of approximately 2.7 mi. Total storage in the 136-acre reservoir is approximately 5,843 af at the normal maximum water surface elevation of approximately 5,022 ft. The usable storage capacity of Lower Bucks Lake is 2,448 af. Water is conveyed from Lower Bucks Lake to the Grizzly Powerhouse by the Grizzly Powerhouse Tunnel. The diversion/outlet tunnel consists of a low-level 24-inch outlet pipe. Upstream control is provided by a 30-inch manually-operated slide gate, and downstream control is provided by a 14-inch-diameter minimum instream flow release (Howell-Bunger) valve.

A.1.1.4 Lower Bucks Lake Tunnel

The Lower Bucks Lake Tunnel, which previously emptied water from Lower Bucks Lake into Grizzly Creek, approximately 3.5 mi upstream from Grizzly Forebay, was operationally abandoned following the completion of the Grizzly Powerhouse Tunnel, however it remains a Project facility.[2]

A.1.1.5 Grizzly Forebay Dam and Reservoir

The Grizzly Forebay Dam consists of a concrete arch dam with a structural height of 98 ft and a length of 520 ft. Grizzly Forebay Dam impounds the Grizzly Forebay, forming the Grizzly Forebay Reservoir that extends approximately 0.8 mi with a shoreline of approximately 1.75 mi. The usable storage capacity of Grizzly Forebay is 420 af. Total storage in the 38-acre reservoir is approximately 1,112 af at the normal maximum water surface elevation of approximately 4,316 ft. The diversion/outlet tunnel consists of a low-level 24-inch pipe controlled by a 30-inch manually-operated slide gate on the upstream face of the dam. The required minimum flow below Grizzly Forebay Dam is 4.0 cfs from November 1 to April 30, 8.0 cfs from May 1 to June 30, and 6.0 cfs from July 1 to October 31.

A.1.1.6 Grizzly Forebay Tunnel

From Grizzly Forebay, the Project's water flow is conveyed through the horseshoe-shaped Grizzly Forebay Tunnel. The tunnel is 9,575-ft-long with two 4,786-ft-long penstocks leading to Bucks Creek Powerhouse. The maximum flow capacity is 400 cfs.

A.1.1.7 Bucks Creek Powerhouse

The Project's water flow is conveyed through the Grizzly Forebay Tunnel to Bucks Creek Powerhouse. Bucks Creek Powerhouse is located on the east bank of NFFR approximately 2 mi downstream from Grizzly Forebay. The Bucks Creek Powerhouse was commissioned on March 4, 1928, and is a 47-ft-long by 132-ft-wide, steel frame and concrete building constructed from reinforced concrete. The powerhouse contains two, double-overhung impulse turbines that each have a rated output of 40,000 horsepower (hp). In addition, the powerhouse includes two revolving field generators that have a total maximum capacity of 65 MW and are rated at 36,300

[2] FERC's Orders of April 29, 1988, and July 10, 1990, at 43 FERC 62,136 and 52 FERC 61,019

kilovolt-amperes (kVA) at 0.8 power factor (PF). The normal maximum gross head of Bucks Creek Powerhouse is 2,558 ft. The powerhouse produces an average annual generation of 223.6 gigawatt-hours (GWh), for an average capacity factor of 41.2 percent.

There are no associated transmission lines at the Bucks Creek Powerhouse. The powerhouse connects directly to the non-project substation adjacent to the Project powerhouse and switchyard that is part of the interconnected transmission system. Bucks Creek Powerhouse discharges the Project's water flow in the NFFR, 1 mi upstream of Rock Creek Powerhouse, part of PG&E's Rock Creek-Cresta Hydroelectric Project (FERC Project No. 1962).

A.1.2 Grizzly Development

A.1.2.1 Grizzly Powerhouse Tunnel

The 12,320-ft-long Grizzly Powerhouse Tunnel (including a 4,900-ft-long buried penstock) conveys the water flow from Lower Bucks Lake to Grizzly Powerhouse. The maximum flow capacity is 400 cfs.

A.1.2.2 Grizzly Powerhouse

The Grizzly Powerhouse is a 65-ft-long by 55-ft-wide, steel frame and concrete building constructed from reinforced concrete. The powerhouse contains one vertical Francis turbine with a rated output of 26,400 hp and one synchronous generator with a maximum capacity of 20 MW which is rated at 22,000 kVA at 0.9 PF. The normal maximum gross head of Grizzly Powerhouse is 719 ft. The powerhouse produces an average annual generation production of 47.4 GWh, for an average capacity factor of 28.2 percent. Grizzly Powerhouse discharges the Project's water flow directly into the Grizzly Forebay.

From the Project switchyard and non-project substation adjacent to the powerhouse, a 4.2-mi-long, 115-kV transmission line transmits power from Grizzly Powerhouse to PG&E's 115-kV Caribou-Palermo line.

Table A.1.2-1 provides a summary of the compositions, dimensions, and configuration of the Project features.

Table A.1.2-1 Project Summary Data

GENERAL INFORMATION	
Owner and Operator	PG&E and the City
FERC Project Number	619
Current License Term	December 19, 1974 – December 31, 2018
Commenced Commercial Operation	Bucks Development 1928; Grizzly Development 1993
County	Plumas County, California
Hydrologic Drainage Basin	North Feather River (18020121)
Watersheds	Bucks Creek, Grizzly Creek, and Milk Ranch Creek
Water Rights	• For Power Generation: Application Numbers 4453, 6241, 2195, 3889, 4441, 4491, 4598, 4871, 29797, and 31499. • Non-Power Water Rights: Application Numbers 2186, 11192, and 5997.
BUCKS CREEK DEVELOPMENT	
Three Lakes Dam and Reservoir	
Dam Location	Milk Ranch Creek, approximately 7 mi northeast from Bucks Creek Powerhouse
Drainage Area (mi^2)	1.3
Dam Type	Rock fill
Dam Height and Length	30 ft high and 584 ft long
Spillway Elevation	6,074.3 ft
Diversion/Outlet Tunnel	30-inch-diameter pipe from the dam tapering to a 20-inch gate valve
Normal Maximum Water Surface Elevation	6,077.8 ft
Normal Minimum Water Surface Elevation	6,050 ft
Reservoir Length	Approx. 0.75 mi (from GIS)
Shoreline Length	Approx. 2 mi (from GIS)
Gross Storage	605 af
Usable Storage	605 af
Surface Area at Maximum Water Surface	40 acres
Required Minimum Flow Below Three Lakes Dam	No required minimum flow release
Bucks Lake Dam and Reservoir	
Dam Location	Bucks Creek, tributary of the NFFR, approximately 17 mi southwest of Quincy, California
Drainage Area (mi^2)	28.6
Dam Type	Rock-fill with concrete face
Dam Height and Length	123 ft high and 1,320 ft long
Spillway Elevation	5,155 ft

Diversion/Outlet Tunnel	• Outlet Type/Capacity: Two 30-inch riveted steel pipes • Upstream control: Two 36-inch-high ball valves; normally fully open • Downstream control: Two 30-inch-diameter, free discharge, needle valves operated by electric motors • Rated capacity: 146 cfs/pipe at El. 5,168 ft; normal maximum total release 250 cfs (may be limited by ball valves)
Normal Maximum Water Surface Elevation	5,157 ft
Normal Minimum Water Surface Elevation	5,100 ft (Normal Year), 5,080 ft (Dry Year)
Reservoir Length	5 mi
Shoreline Length	14 mi
Gross Storage	105,605 af
Usable Storage	105,300 af
Surface Area at Maximum Water Surface	1,827 acres
Required Minimum Flow Below Bucks Lake Dam	No required minimum flow release
Lower Bucks Lake Dam and Reservoir	
Dam Location	Bucks Creek, tributary of the NFFR, approximately 17 mi southwest of Quincy, CA
Drainage Area (mi^2)	31.2
Dam Type	Concrete Arch
Dam Height and Length	99 ft high and 500 ft long
Spillway Elevation	5,022 ft
Diversion/Outlet Tunnel	• Low-level Outlet: 24-inch pipe • Upstream control by a 30-inch manually operated slide gate at about invert El. 4,952 ft. • Downstream control by a 14-inch-diameter minimum instream flow release (Howell-Bunger) valve.
Howell-Bunger Valve	14-inch-diameter installed on low level outlet pipe in 2007
Normal Maximum Water Surface Elevation	5,022 ft
Normal Minimum Water Surface Elevation	5,003.5 ft
Reservoir Length	Approx. 1.1 mi (from GIS)
Shoreline Length	Approx. 2.7 mi (from GIS)
Gross Storage	5,843 af
Usable Storage	2,448 af
Surface Area at Maximum Water Surface	136 acres
Required Minimum Flow Below Lower Bucks Lake Dam (Gage NF-82)	• 4.0 cfs (November 1 to April 30) • 8.0 cfs (May 1 to June 30) • 6.0 cfs (July 1 to October 31)

Grizzly Forebay Dam and Reservoir	
Dam Location	Grizzly Creek, approximately 2 mi upstream of Bucks Creek Powerhouse
Drainage Area (mi^2)	14.6
Dam Type	Concrete Arch
Dam Height and Length	98 ft high and 520 ft long
Spillway Elevation	4,316 ft
Diversion/Outlet Tunnel	Low-level: 24-inch pipe controlled by a 30-inch manually operated slide gate on the upstream face of the dam at about invert El. 4,250 ft.
Howell-Bunger Valve	10-inch-diameter installed on low level outlet pipe in 2008
Normal Maximum Water Surface Elevation	4,316 ft
Normal Minimum Water Surface Elevation	4,304.5 ft
Reservoir Length	Approx. 0.8 mi (from GIS)
Shoreline Length	Approx. 1.75 mi (from GIS)
Gross Storage	1,112 af
Usable Storage	420 af
Surface Area at Maximum Water Surface	38 acres
Required Minimum Flow Below Grizzly Forebay Dam (Gage NF-22)	• 4.0 cfs (November 1 to April 30) • 8.0 cfs (May 1 to June 30) • 6.0 cfs (July 1 to October 31)
Grizzly Forebay Tunnel	
Location	Grizzly Forebay to Bucks Creek Powerhouse
Tunnel Type	Horseshoe
Length	9,575 ft, and two 4,786-ft penstocks leading to Bucks Creek Powerhouse
Diameter	8 to 12 ft; 3 to 4.5 ft (Penstocks)
Maximum Flow Capacity	400 cfs
Bucks Creek Powerhouse	
Location	NFFR, east bank, approximately 0.2 mi downstream of Bucks Creek confluence with NFFR.
Date of Commission	March 4, 1928
Structure	Steel Frame and Concrete Building
Construction Material	Reinforced Concrete
Approximate Size	47 by 132 ft
Turbine	
• Number of Units	Two
• Type	Double-overhung Impulse
• Manufacturer	Pelton Co./Vevey Engineering Works Ltd.

• Rated Output	40,000 hp each
• Maximum Hydraulic Capacity	384 cfs
• Speed	450 RPM
Generator	
• Number and Type	Two revolving field
• Manufacturer	General Electric
• Rated Capacity	36,300 kVA at 0.8 PF each at a temperature rise of 60 degrees Celsius and 41,745 kVA at 0.8 PF at a temperature rise of 80 degrees Celsius
• Maximum Capacity	65 MW total
• Licensed Nameplate Capacity	Each unit has a capacity of 29,040 MW at a temperature rise of 60 degrees Celsius and 33,396 at a temperature rise of 80 degrees Celsius.
• Voltage	11 kV
• Average Annual Energy	223.6 GWh per year
• Closest Downstream Facility	Rock Creek Powerhouse, 1 mi downstream
• Transmission Line	No transmission line exists. The powerhouse connects directly to the non-project substation adjacent to the powerhouse part of the inter-connected transmission system.
GRIZZLY DEVELOPMENT	
Grizzly Powerhouse Tunnel	
Location	Lower Bucks Lake to Grizzly Powerhouse
Tunnel Type	Tunnel Boring Machine and conventional excavation
Length	12,320 ft, and 4,900-ft (buried) penstock leading to Grizzly Powerhouse
Diameter	11 to 14 ft, 4.5 to 8 ft (Penstock)
Maximum Flow Capacity	400 cfs
Grizzly Powerhouse	
Location	Grizzly Creek, 2.5 mi above Bucks Creek Powerhouse
Date of Commission	November 18, 1993
Structure	Steel Frame and Concrete Building
Construction Material	Reinforced Concrete
Approximate Size	65 by 55 ft
Turbine	
• Number of Units	One
• Type	Vertical Francis
• Manufacturer	American Hydro
• Rated Output	26,400 hp
• Maximum Hydraulic Capacity	395 cfs
• Speed	450 RPM

Generator	
• Type	Synchronous
• Manufacturer	Asea, Brown Boveri
• Rated Capacity	Unit No. 1 – 22,000 kVA at 0.9 PF
• Maximum Capacity	20 MW
• Licensed Nameplate Capacity	19.8 MW
• Voltage	6.9 kV
• Average Annual Energy (since Date of Commission)	47.4 GWh per year
• Closest Downstream Facility	Bucks Creek Powerhouse, 2.5 mi downstream
• Transmission Line	4.2-mi-long, 115-kV transmission line interconnecting the development to PG&E's 115-kV Caribou-Palermo line

USGS 2005. North Fork Feather River (18020121).

All elevations in this table are National Geodetic Vertical Datum (NGVD), also referred to as U.S. Geological Survey (USGS) datum. Elsewhere in this document, elevations may be expressed using a different datum. Elevations in "PG&E (formerly, Feather River Power Company) Datum" are 3.5 ft lower than those expressed as "USGS Datum."

af = acre-feet
cfs = cubic feet per second
City = City of Santa Clara
El. = Elevation
GIS = Geographic Information System
GWh = gigawatt-hours
hp = horsepower
kV = kilovolt
kVA = kilovolt-amperes
mi^2 = square miles
MW = megawatt
NFFR = North Fork Feather River
PF = power factor
PG&E = Pacific Gas and Electric Company
RPM = revolutions per minute

A.2 Proposed Project Facilities

At the current time, the Licensees do not propose to add any new generation facilities to the Project.

A.3 Additional Facilities and Equipment

A.3.1 Project Switching Center

The Project is a peaking system normally operated remotely from PG&E's Rock Creek Powerhouse Switching Center. Powerhouse operations, minimum instream flows, and reservoir levels are monitored and controlled 24 hours a day, 7 days a week at the switching center. Roving operators inspect Bucks Creek and Grizzly powerhouses regularly. If an alarm at a powerhouse or other Project facility is received at the Switching Center, a roving operator is dispatched to investigate the cause of the alarm and to correct any problems that may exist. The Licensees typically schedule planned maintenance of dams, powerhouses, and penstocks during low electric power demand periods.

Operations of Three Lakes, Bucks Lake, Lower Bucks Lake, and Grizzly Forebay are coordinated to optimize the use of water. Project operations are coordinated with the operations of PG&E's other three FERC-licensed hydroelectric projects in the NFFR watershed (FERC Project Nos. 1962 [Rock Creek Cresta], 2105 [Upper North Fork Feather River], and 2107[Poe]). Figure A.3.1-1 is a schematic overview diagram of all four projects.